

AMENDMENT TO THE CLAIMS

The following claim set replaces all prior versions, and listings, of claims in the application:

1. (currently amended) A method for controllably thickening a pulp comprised of a low consistency fiber suspension, said method comprising the steps of:

introducing a pulp comprised of a low consistency fiber suspension into a pre-thickener apparatus at a feeding pressure, the pre-thickener apparatus having a perforated filter surface, a shaft and a cleaning member attached to the shaft so as to define ~~and~~ a space ~~defined~~ between the shaft and the cleaning member,

removing liquid from a portion of the pulp through the perforated filter surface in said pre-thickener apparatus by means of the feeding pressure of the pulp into the pre-thickener apparatus to form a thickened pulp, a filtrate, and an ~~essentially~~ unthickened pulp, allowing a layer of the thickened pulp to be formed on the perforated filter surface of the pre-thickener apparatus,

wiping the layer of the thickened pulp off the perforated filter surface of ~~said the~~ pre-thickener apparatus with the cleaning member to prevent a permanent precoat pulp layer from forming on the perforated filter surface by pushing the layer of the thickened pulp by the cleaning member in an essentially axial direction along the perforated filter surface to the discharge end of the pre-thickener apparatus to thereby provide an open portion of the perforated filter surface behind the cleaning member onto which unthickened pulp may be deposited,

~~while~~ simultaneously while wiping the layer of the thickened pulp off the perforated filter surface allowing the ~~essentially~~ non-thickened pulp



LAINE et al
Serial No. 10/689,665
November 20, 2006

to flow through the apparatus from the feeding end to the discharge end via the space defined between the shaft and the cleaning member,

discharging from the pre-thickener apparatus the filtrate and the thickened pulp wiped from the perforated filter surface by the cleaning member ~~layer of the thickened pulp and the filtrate,~~

guiding a part of the ~~essentially~~ non-thickened pulp to a the open portion of the perforated filter surface ~~being behind~~ wiped by the cleaning member that was provided during wiping of the perforated filter surface;

regulating the flow speed of the pulp in the pre-thickener apparatus by means of valves for the filtrate and the thickened pulp; and

controlling the thickening of the pulp in response to input power or input torque of the cleaning member or in response to a pressure difference prevailing over the filter surface.

2. (previously presented) A method according to claim 1, comprising supplying pulp to said pre-thickener apparatus from a screen, the screening consistency of which is about 2 – 4 %.

3. (previously presented) A method according to claim 1, wherein the pulp thickened by the pre-thickener apparatus is taken into a filter, the feeding consistency of which is 3 – 6 %.

4. (previously presented) A method according to claim 2, wherein between the screen and the filter the consistency of the pulp is raised by said pre-thickener by 1 – 4 %.

5. (currently amended) A method according to claim 1, comprising rotating the cleaning member at a rotational ~~speed~~ speed sufficient to create a flow speed for the

~~thickened~~ layer of the thickened pulp of less than 3 m/s towards the discharge end of the pre-thickener apparatus.

6. (currently amended) A method according to claim 5, wherein said flow speed of the ~~thickened~~ layer of the thickened pulp is between 0.2-1.0 m/s, preferably about 0.5 m/s.

7. (currently amended) A method according to claim 1, wherein the cleaning member comprises a rotatable screw having a selected screw pitch, and wherein the method comprises rotating the feeding speed of the screw at a selected rotational speed so that the selected rotational speed and pitch of the screw establish a flow speed of the layer of the thickened pulp being pushed thereby and the a flow speed of the non-thickened pulp which are essentially the same at the discharge end of the apparatus.

8. (previously presented) A method according to claim 1, further comprising using a pump so as to create the feeding pressure of the pre-thickener apparatus.

9. (previously presented) A method according to claim 1, wherein said step of controlling the thickening of the pulp further comprises regulating the flow of incoming pulp, filtrate and/or thickened pulp with valves.

10. (cancelled)

11. (previously presented) A method according to claim 9, further comprising regulating the consistency of the thickened pulp to a desired value by changing a flow amount ratio between the thickened pulp and the filtrate.

12. (previously presented) A method according to claim 9, further comprising regulating the consistency of the thickened pulp to a desired value by changing a flow amount ratio between the low consistency pulp to be thickened and the filtrate.

13. (cancelled)

14. (previously presented) A method according to claim 9, wherein said step of controlling the thickening of the pulp comprises maintaining a constant pressure difference over the filter surface.

15. (currently amended) A method according to claim 9, wherein said step of controlling the thickening of the pulp further comprises controlling the thickening of the pulp in response to pulp consistency information ~~a process signal~~ obtained from a previous or later process stage.

16. (previously presented) A method according to claim 1, wherein said step of controlling the thickening of the pulp further comprises changing the rotational speed of the cleaning member.

17. (previously presented) A method according to claim 1, further comprising using said filtrate for dilution in a previous process stage.

18. (previously presented) A method according to claim 1, further comprising using said filtrate for dilution in the same process stage.

19. (previously presented) A method according to claim 1, further comprising separating fibers from said filtrate by a fiber separating means prior to reusing the filtrate.

20 - 25. (canceled)

26. (currently amended) A method for controllably thickening a pulp comprised of a low consistency fiber suspension, said method comprising the steps of:

introducing a pulp comprised of a low consistency fiber suspension into a pre-thickener apparatus at a feeding pressure, the pre-thickener apparatus having a perforated filter surface, a shaft and a cleaning

member attached to the shaft, and a space defined between the shaft and the cleaning member,

removing liquid from a portion of the pulp through the perforated filter surface in said pre-thickener apparatus by means of the feeding pressure of the pulp into the pre-thickener apparatus to form a thickened pulp, a filtrate, and an ~~essentially~~ unthickened pulp, allowing a layer of the thickened pulp to be formed on the perforated filter surface of the pre-thickener apparatus,

wiping the layer of the thickened pulp off the perforated filter surface of ~~said the~~ pre-thickener apparatus with the cleaning member to prevent a permanent precoat pulp layer from forming on the perforated filter surface by pushing the layer of the thickened pulp by the cleaning member in an essentially axial direction along the perforated filter surface to the discharge end of the pre-thickener apparatus to thereby provide an open portion of the perforated filter surface behind the cleaning member onto which unthickened pulp may be deposited,

~~while~~ simultaneously while wiping the layer of the thickened pulp off the perforated filter surface, allowing the ~~essentially~~-non-thickened pulp to flow through the apparatus from the feeding end to the discharge end via the space defined between the shaft and the cleaning member,

discharging from the pre-thickener apparatus the filtrate and the thickened pulp wiped from the perforated filter surface by the cleaning member ~~layer of the thickened pulp and the filtrate,~~

guiding a part of the ~~essentially~~ non-thickened pulp to a the open portion of the perforated filter surface ~~being behind wiped by~~ the cleaning

member that was provided during wiping of the perforated filter surface;
controlling the thickening of the pulp by ~~regulating~~ measuring the flow of incoming pulp, filtrate and/or thickened pulp, and
maintaining a ratio of the incoming pulp flow and the filtrate flow so as to
maintain consistency of the thickened pulp discharged from the pre-thickener apparatus, wherein; ~~with valves; and~~
~~controlling~~ the ratio of the incoming pulp flow and the filtrate flow is
controlled by valves in response to input power or input torque of the cleaning member or in response to a pressure difference prevailing over the filter surface or in response to a process signal obtained from a previous or later process stage.